ASSESSMENT OF ROLE OF PHYSIOTHERAPY IN MANAGEMENT OF ORAL SUBMUCOUS FIBROSIS

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ABSTRACT:

Background: Oral Submucous Fibrosis (OSMF) is a chronic disease affecting the oral mucosa, as well as the pharynx and the upper two thirds of the esophagus. The present study was conducted to assess role of physiotherapy in management of Oral Submucous Fibrosis (OSMF).

Materials & Methods: 30 OSMF patients aged between 16-50 years were classified into 3 groups. Group 1 patients were treated with intralesional injections of hyaluronidase (1500 U) and dexamethasone (4 mg/ml) biweekly for 6 weeks. Group II patients were treated with basic physiotherapy regimen consisting of mouth exercises twice a day for 6 weeks and group III patients were treated with both physiotherapy and intralesional injections. Parameters such as mouth opening, tongue protrusion and cheek flexibility were measured before treatment and at intervals of 2 weeks, 4 weeks and 6 weeks after treatment.

Results: Group I had 7 males and 3 females, group II had 5 males and 5 females and group III had 4 males and 6 females. Pre-treatment mouth opening was 27.1 mm, at 2 weeks was 28.6 mm, at 4 weeks was 30.7 mm and at 6 weeks was 31.9 mm. In group II was 28.4 mm, 30.6 mm, 30.9 mm and 32.0 mm. In group III was 26.8 mm, 29.4 mm, 30.2 mm and 31.4 mm at pre-treatment, 2 weeks, 4 weeks and 6 weeks respectively. Pre-treatment, at 2 weeks and at 6 weeks tongue protrusion was 35.4 mm, 37.4 mm, 40.5 mm and 42.5 mm in group I. It was 38.1 mm, 41.6 mm, 42.7 mm and 43.1 mm in group II and 38.5 mm, 41.9 mm, 44.1 mm and 46.7 mm in group III respectively. There was significant improvement in cheek flexibility in all groups. The difference was significant (P<0.05).

Conclusion: There was significant improvement in all parameters in all groups. Physiotherapy found to be effective one and hence it can be used as an adjunct in treating OSMF patients.

Key words: Hyaluronidase, Oral Submucous Fibrosis, Physiotherapy

I. INTRODUCTION

Oral Submucous Fibrosis (OSMF) is a chronic disease affecting the oral mucosa, as well as the pharynx and the upper two thirds of the esophagus. It is characterized by burning sensation in the oral cavity, blanching and stiffening of the oral mucosa and oropharynx which ultimately leads to trismus. Joshi coined the term Submucous fibrosis of the palate and pillars.
Pindborg et al reported the prevalence of Oral submucous fibrosis in India as 0.2-0.5%. In a hospital-based survey conducted in Lucknow, Bombay, Bangalore and Trivandrum the prevalence was recorded as 0.51%, 0.5%, 0.18% and 1.2% respectively. Hydrolysis of arecine produces arecaidine that has pronounced effects on fibroblasts. Arecine in high doses was cytotoxic and cells showed detachment from the culture surface. The copper content of areca nut is high and the levels of soluble copper in saliva may rise in volunteers who chew areca quid. The same group showed that the oral mucosa of areca nut chewers had significantly raised levels of copper when compared with the control subjects. The association between copper and OSF has been linked on the basis that excess copper is found in tissues of other fibrotic disorders—Wilson’s disease, Indian childhood cirrhosis and primary biliary cirrhosis. The enzyme lysyl oxidase is found to be upregulated in OSFM.

Physiotherapy which encompasses mouth exercises, heat, therapeutic ultrasound and microwave diathermy is effective management. Physiotherapy is a non-invasive modality which may aid in the symptomatic treatment of patients with OSMF. The present study was conducted to assess role of physiotherapy in management of Oral Submucous Fibrosis (OSMF).

II. MATERIALS & METHODS

The present study comprised of 30 OSMF patients aged between 16-50 years of both genders. All were informed regarding the study and their written consent was obtained. Only stage II OSMF patients with mouth opening less than 35 mm were taken.

They were classified into 3 groups. Each group had 10 patients. Group 1 patients were treated with intralesional injections of hyaluronidase (1500 U) and dexamethasone (4 mg/ml) biweekly for 6 weeks. Group II patients were treated with basic physiotherapy regimen consisting of mouth exercises twice a day for 6 weeks and group III patients were treated with both physiotherapy and intralesional injections. Parameters such as mouth opening, tongue protrusion and cheek flexibility were measured before treatment and at intervals of 2 weeks, 4 weeks and 6 weeks after treatment. Results were collected, compiled and entered in MS sheet for correct statistical inference where p value less than 0.05 was considered significant.

III. RESULTS

Table I Distribution of patients

<table>
<thead>
<tr>
<th>Groups</th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>hyaluronidase (1500 U) and</td>
<td>Physiotherapy</td>
<td>Physiotherapy and intralesional injections</td>
</tr>
<tr>
<td></td>
<td>dexamethasone (4 mg/ml)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M:F</td>
<td>7:3</td>
<td>5:5</td>
<td>4:6</td>
</tr>
</tbody>
</table>

Table I shows that group I had 7 males and 3 females, group II had 5 males and 5 females and group III had 4 males and 6 females.

Table II Comparison of mouth opening (mm) in all groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pre-treatment</th>
<th>2 weeks</th>
<th>4 weeks</th>
<th>6 weeks</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>27.1</td>
<td>28.6</td>
<td>30.7</td>
<td>31.9</td>
<td>0.15</td>
</tr>
<tr>
<td>Group II</td>
<td>28.4</td>
<td>30.6</td>
<td>30.9</td>
<td>32.0</td>
<td>0.17</td>
</tr>
<tr>
<td>Group III</td>
<td>26.8</td>
<td>29.4</td>
<td>30.2</td>
<td>31.4</td>
<td>0.24</td>
</tr>
</tbody>
</table>

Table II shows that pre-treatment mouth opening was 27.1 mm, at 2 weeks was 28.6 mm, at 4 weeks was 30.7 mm and at 6 weeks was 31.9 mm. In group II was 28.4 mm, 30.6 mm, 30.9 mm and 32.0 mm. In group III was 26.8 mm, 29.4 mm, 30.2 mm and 31.4 mm at pre-treatment, 2 weeks, 4 weeks and 6 weeks respectively. The difference was non-significant (P>0.05).

Table III Comparison of tongue protrusion (mm) in all groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pre-treatment</th>
<th>2 weeks</th>
<th>4 weeks</th>
<th>6 weeks</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>35.4</td>
<td>37.4</td>
<td>40.5</td>
<td>42.5</td>
<td>0.03</td>
</tr>
<tr>
<td>Group II</td>
<td>38.1</td>
<td>41.6</td>
<td>42.7</td>
<td>43.1</td>
<td>0.09</td>
</tr>
<tr>
<td>Group III</td>
<td>38.5</td>
<td>41.9</td>
<td>44.1</td>
<td>46.7</td>
<td>0.16</td>
</tr>
</tbody>
</table>
Table III, graph I shows that pre-treatment, at 2 weeks, at 4 weeks and at 6 weeks tongue protrusion was 35.4 mm, 37.4 mm, 40.5 mm and 42.5 mm in group I. It was 38.1 mm, 41.6 mm, 42.7 mm and 43.1 mm in group II and 38.5 mm, 41.9 mm, 44.1 mm and 46.7 mm in group III respectively. The difference was significant in group I (P<0.05).

![Graph I Comparison of tongue protrusion (mm) in all groups](image)

Table IV shows that there was significant improvement in cheek flexibility in all groups. The difference was significant (P<0.05).

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pre-treatment</th>
<th>2 weeks</th>
<th>4 weeks</th>
<th>6 weeks</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>0.78</td>
<td>0.80</td>
<td>0.81</td>
<td>0.85</td>
<td>0.05</td>
</tr>
<tr>
<td>Group II</td>
<td>0.75</td>
<td>0.84</td>
<td>0.90</td>
<td>0.92</td>
<td>0.06</td>
</tr>
<tr>
<td>Group III</td>
<td>0.82</td>
<td>0.85</td>
<td>0.88</td>
<td>0.90</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Table IV shows that there was significant improvement in cheek flexibility in all groups. The difference was significant (P<0.05).

**IV. DISCUSSION**

Oral Submucous fibrosis is a chronic disease of insidious onset featuring the deposition of fibrous tissue in the juxta-epithelial layer of mucous membrane involving the pharynx, palate, faces, cheek and lips, pharynx and oesophagus, found among people who chew betel nut (Areca catechu) with or without tobacco and other ingredients. This condition is characterized by fibrotic changes and severe burning sensation with restricted opening of mouth. Haider SM clinically graded OSMF into: Stage I: Faucial bands only. Stage II: Faucial bands and buccal bands, Stage III: Facial, buccal and labial bands and functionally graded OSF into stage A: Mouth opening ≥ 20 mm, Stage B: Mouth opening 10-19 mm, Stage C: Mouth opening ≤ 10 mm. The present study was conducted to assess role of physiotherapy in management of Oral Submucous Fibrosis (OSMF).

In present study, group I had 7 males and 3 females, group II had 5 males and 5 females and group III had 4 males and 6 females. We found that pre-treatment mouth opening was 27.1 mm, at 2 weeks was 28.6 mm, at 4 weeks was 30.7 mm and at 6 weeks was 31.9 mm. In group II was 28.4 mm, 30.6 mm, 30.9 mm and 32.0 mm. In group III was 26.8 mm, 29.4 mm, 30.2 mm and 31.4 mm at pre-treatment, 2 weeks, 4 weeks and 6 weeks respectively. Asha et al evaluated the effectiveness of physiotherapy in improving mouth opening, tongue protrusion and cheek flexibility in patients with OSMF. Forty-eight OSMF patients were assigned into three groups by drawing chits. Group 1: patients receiving intralesional injections of dexamethasone and hyaluronidase; Group 2: patients receiving physiotherapy; Group 3: patients receiving both intralesional injections and physiotherapy. Mouth opening, tongue protrusion and cheek flexibility was assessed in all the patients before intervention and at different time intervals of 2 weeks, 4 weeks and 6 weeks after treatment. Intragroup: In Group 2, the mean values of mouth...
opening, tongue protrusion and cheek flexibility were increased in time but were statistically insignificant. The mean values of mouth opening, tongue protrusion and cheek flexibility were markedly increased over a period of time in Group 3 and cheek flexibility was found to be statistically significant (p = 0.05). Intergroup: The mean differences of mouth opening, cheek flexibility and tongue protrusion was found to be maximum in group 3 and it was statistically significant (p=0.03) for tongue protrusion.

We found that pre-treatment, at 2 weeks, at 4 weeks and at 6 weeks tongue protrusion was 35.4 mm, 37.4 mm, 40.5 mm and 42.5 mm in group I. It was 38.1 mm, 41.6 mm, 42.7 mm and 43.1 mm in group II and 38.5 mm, 41.9 mm, 44.1 mm and 46.7 mm in group III respectively. Cox et al11 in their study fifty-four Nepali OSMF patients were managed for 4 months in three randomly assigned groups receiving either: five times daily physiotherapy by inter-positioning tongue spatulas between teeth and adding a new spatula every 5-10 days; local injection of hyaluronidase with steroids; or no active treatment. More males presented with OSMF than females (p < 0.05). All patients reported reduced opening and 47% had mucosal pain. Progressive mucosal involvement was always in the same order, starting with the soft palate, and then progressing to the fauces, unilateral buccal mucosa, bilateral buccal mucosa, floor of mouth and finally lip mucosa (p < 0.006). Physiotherapy improved oral opening (p < 0.0005), but not oral pain, while no clear improvement was seen in untreated patients as well as patients managed by injection.

We observed that there was significant improvement in cheek flexibility in all groups. Kumar et al12 in clinical trial 15 individuals with history of tobacco chewing and complaints of reduced mouth opening, burning sensation in the mouth while eating food with histopathological confirmation of OSMF volunteered for the study. After a complete history and consent they were assessed for mouth opening & tongue protrusion with a vernier caliper. They were treated with Ultrasound therapy, intensity from 0.7 – 1.5 W/cm2 (depending upon their thickness of fibrous bands) over the skin of the buccal region of the affected sides with finger and thumb kneading, consecutively for 6 days/week for 2 weeks. They were advised with a set of home programme and to avoid spicy foods. The mean improvement in mouth opening was 6.26mm. (range 2mm-11mm with 75% patients increased by 9mm) Repeated Measures ANOVA; F = 55.54 and p value = 0.0001. Dunnett test for multiple comparisons revealed that tenth day onwards there was statistically significant difference in the mean mouth opening p<0.05.

V. CONCLUSION

Authors found that there was significant improvement in all parameters in all groups. Physiotherapy found to be effective one and hence it can be used as an adjunct n treating OSMF patients.

REFERENCES